Joining Aluminium Alloy and Mild Steel Sheets by Roller Clinching

Abstract:
Roller clinching is a mechanical joining method, which combines conventional clinching with rotational tool movement. For that purpose, punches and dies are mounted on contrariwise rotating rolls, while the sheets are continuously fed forward. The rotation affects the joint formation and therefore the mechanical joint properties. In this paper, the ratio between the rolling radii of punch and die is varied. Shear tests are conducted for the material combination steel and aluminium with different sheet thicknesses. Because of the asymmetry of the resulting clinchpoints, the joint strengths are examined in different load directions. The joint formation is analysed using cross sections and the effects of different punch geometries are discussed. Finite element simulations are used to gain deeper process insight.

Zeitschriftenauflage:
Applied Mechanics and Materials

Jahr:
2015

Band:
794

Seiten:
295-303

Reviewed:
ja

Sprache:
en

Volltext / DOI:
http://doi.org/10.4028/www.scientific.net/amm.794.295